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Indian Standard

HOT-ROLLED STRUCTURAL STEEL PLATES — TOLERANCES ON DIMENSIONS AND SHAPE

ICS 77.140.01; 77.140.50

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 7

Wrought Steel Products Sectional Committee, MTD 4

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 7452 : 2002 'Hot-rolled structural steel plates — Tolerances on dimensions and shape' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Wrought Steel Products Sectional Committee and approval of the Metallurgical Engineering Division Council.

This standard has been taken up to align it with ISO 7452 : 2002 by adoption under dual numbering system.

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker in the International Standard while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

HOT-ROLLED STRUCTURAL STEEL PLATES — TOLERANCES ON DIMENSIONS AND SHAPE

1 Scope

This International Standard specifies requirements for tolerances for hot-rolled steel plates made on a reversing mill (excluding stainless steels) with the following characteristics:

a) nominal thickness $\geqslant$ 4 mm but $\leqslant$ 400 mm;

b) nominal width $\geqslant$ 600 mm;

c) specified minimum yield strength $\leqslant$ 700 N/mm^2.

Tolerances for products of width < 600 mm, cut or slit from plate, should be agreed between manufacturer and purchaser at the time of inquiry and order.

Tolerances on dimensions and shape of steel plates having a specified minimum yield stress greater than 700 N/mm^2 should be the subject of agreement at the time of inquiry and order.

This International Standard does not include continuous mill products, custom-made plate, checker plate or bulb plate for flooring or wide flats.

It does not apply to continuous hot-rolled steel plates as defined in specific International Standards (see ISO 4995, ISO 4996, ISO 5951, ISO 5952).

2 Information to be supplied by the purchaser

2.1 General

The following information shall be supplied by the purchaser at the time of inquiry and order.

a) description of this product (plate);

b) number of this International Standard, i.e. ISO 7452;

c) nominal thickness, in millimetres;

d) the thickness tolerance table and class required (Table 1 class N; Table 2 class A, B, or C) (see 3.2 and 4.1.1);

e) nominal width, in millimetres (see 4.2.1);

f) the letters NK if plate with mill edges is required (see 4.2.2);

(Option 1, see clause 9.)

g) the flatness tolerance required (Table 5, 6, 7 or 8);

h) nominal length, in millimetres (see 4.3);

i) the letter G if plate with limited edge camber and out-of-squareness is required (see 5.1);

(Option 2, see clause 9.)

2.2 Options

A number of options are specified in clause 9. In the event that the purchaser does not indicate his wish to implement any of these options, the supplier shall supply the goods in accordance with the basic specification (see 3.2).

3 Form of supply

3.1 Plate shall be supplied:

— with thickness tolerances of Table 1 (class N) or Table 2 (class A, B or C) (see 4.1.1);

— with trimmed edges or with mill edges (NK) (see 4.2.2).

3.2 In the absence of information in the order or of code letters for the supply, plate shall be supplied as follows:

— sheared or flame cut edges;

— normal thickness tolerances, class N (see Table 1);

— edge camber and out-of-squareness in accordance with 5.1;

— normal flatness tolerances (see Table 5).

4 Tolerances on dimensions

4.1 Thickness

4.1.1 Tolerances on thickness are given in Table 1.

When the purchaser requires another distribution of tolerances (Table 2), the purchaser shall indicate if class A, B or C is required (see 2.1).

— class A: for minus thickness tolerances depending on the nominal thickness;

— class B: for a fixed minus tolerance of 0,3 mm;

— class C: for all plus tolerances depending on the nominal thickness.

4.1.2 The special provision applicable to ground parts of the surface of the plates are given in the International Standards for the corresponding products.

Table 1 — Range of tolerances on thickness (class N)

Dimensions in millimetres

Nominal thickness t	Nominal width, w					
	$w < 2\,000$		$2\,000 \leqslant w < 4\,000$		$4\,000 \leqslant w$	
	lower	upper	lower	upper	lower	upper
$4{,}00 \leqslant t < 5{,}00$	− 0,60	+ 0,60	− 0,65	+ 0,65	—	—
$5{,}00 \leqslant t < 8{,}00$	− 0,60	+ 0,60	− 0,75	+ 0,75	—	—
$8{,}00 \leqslant t < 15{,}0$	− 0,65	+ 0,65	− 0,80	+ 0,80	− 0,90	+ 0,90
$15{,}0 \leqslant t < 25{,}0$	− 0,75	+ 0,75	− 0,95	+ 0,95	− 1,10	+ 1,10
$25{,}0 \leqslant t < 40{,}0$	− 0,80	+ 0,80	− 1,00	+ 1,00	− 1,20	+ 1,20
$40{,}0 \leqslant t < 80{,}0$	− 1,00	+ 1,00	− 1,20	+ 1,20	− 1,40	+ 1,40
$80{,}0 \leqslant t < 150$	− 1,40	+ 1,40	− 1,60	+ 1,60	− 1,80	+ 1,80
$150 \leqslant t < 250$	− 1,80	+ 1,80	− 1,95	+ 1,95	− 2,10	+ 2,10
$250 \leqslant t \leqslant 400$	− 2,00	+ 2,00	− 2,20	+ 2,20	− 2,40	+ 2,40

NOTE 1 For heavier plate thicknesses (⩾ 40 mm) for special applications, an increased plus (+) tolerance may be permitted by agreement between the purchaser and the manufacturer.

NOTE 2 By agreement at the time of enquiry and order, and additionally to the N tolerances, a maximum thickness difference within any plate may be applied, see annex A.

Table 2 — Classes of distribution of tolerances on thickness

Dimensions in millimetres

Nominal thickness	Nominal width, w																	
	$w < 2\,000$						$2\,000 \leqslant w < 4\,000$						$4\,000 \leqslant w$					
	Class A		Class B		Class C		Class A		Class B		Class C		Class A		Class B		Class C	
	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper
$4,00 \leqslant t < 5,00$	- 0,40	+ 0,80	- 0,30	+ 0,90	0	+ 1,20	- 0,45	+ 0,85	- 0,30	+ 1,00	0	+ 1,30	—	—	—	—	—	—
$5,00 \leqslant t < 8,00$	- 0,40	+ 0,80	- 0,30	+ 0,90	0	+ 1,20	- 0,50	+ 1,00	- 0,30	+ 1,20	0	+ 1,50	—	—	—	—	—	—
$8,00 \leqslant t < 15,0$	- 0,45	+ 0,85	- 0,30	+ 1,00	0	+ 1,30	- 0,50	+ 1,10	- 0,30	+ 1,30	0	+ 1,60	- 0,60	+ 1,20	- 0,3	+ 1,50	0	+ 1,80
$15,0 \leqslant t < 25,0$	- 0,50	+ 1,00	- 0,30	+ 1,20	0	+ 1,50	- 0,65	+ 1,25	- 0,30	+ 1,60	0	+ 1,90	- 0,70	+ 1,50	- 0,3	+ 1,90	0	+ 2,20
$25,0 \leqslant t < 40,0$	- 0,55	+ 1,05	- 0,30	+ 1,30	0	+ 1,60	- 0,65	+ 1,35	- 0,30	+ 1,70	0	+ 2,00	- 0,80	+ 1,60	- 0,3	+ 2,10	0	+ 2,40
$40,0 \leqslant t < 80,0$	- 0,65	+ 1,35	- 0,30	+ 1,70	0	+ 2,00	- 0,80	+ 1,60	- 0,30	+ 2,10	0	+ 2,40	- 0,90	+ 1,90	- 0,3	+ 2,50	0	+ 2,80
$80,0 \leqslant t < 150$	- 0,90	+ 1,90	- 0,30	+ 2,50	0	+ 2,80	- 1,05	+ 2,15	- 0,30	+ 2,90	0	+ 3,20	- 1,20	+ 2,40	- 0,3	+ 3,30	0	+ 3,60
$150 \leqslant t < 250$	- 1,20	+ 2,40	- 0,30	+ 3,30	0	+ 3,60	- 1,30	+ 2,60	- 0,30	+ 3,60	0	+ 3,90	- 1,40	+ 2,80	- 0,3	+ 3,90	0	+ 4,20
$250 \leqslant t \leqslant 400$	- 1,30	+ 2,70	- 0,30	+ 3,70	0	+ 4,00	- 1,45	+ 2,95	- 0,30	+ 4,10	0	+ 4,40	- 1,60	+ 3,20	- 0,3	+ 4,50	0	+ 4,80

Either plus side (+) or minus side (-) of the thickness tolerances given in this table may be limited on request. Also a minus side of thickness of 0,3 mm is permitted. In all cases the total tolerances shall be equal to those given in Table 1.

NOTE By agreement at the time of enquiry and order, and in addition to the A, B and C tolerances, a maximum thickness difference within any plate may be applied, see annex A.

4.2 Width

4.2.1 Tolerances on width are given in Table 3

Table 3 — Tolerances on width

Dimensions in millimetres

Nominal width w	Tolerances	
	lower	upper
$600 \leqslant w < 2\,000$	0	+ 15
$2\,000 \leqslant w < 3\,000$	0	+ 20
$w \geqslant 3\,000$	0	+ 25

4.2.2 Tolerances on width for plates with untrimmed edges (NK) shall be the subject of agreement between the manufacturer and purchaser at the time of enquiry and order.

(Option 1, see clause 9.)

4.3 Length

Tolerances on length are given in Table 4.

Table 4 — Tolerances on length

Dimensions in millimetres

Nominal length l	Tolerances	
	lower	upper
$600 \leqslant l < 4\,000$	0	+ 20
$4\,000 \leqslant l < 6\,000$	0	+ 30
$6\,000 \leqslant l < 8\,000$	0	+ 40
$8\,000 \leqslant l < 10\,000$	0	+ 50
$10\,000 \leqslant l < 15\,000$	0	+ 75
$15\,000 \leqslant l \leqslant 20\,000$ [a]	0	+ 100

[a] Tolerances on plates with a nominal length > 20 000 mm shall be agreed at the time of the enquiry and order.

(Option 3, see clause 9.)

5 Tolerances on shape

5.1 Edge camber and out-of-squareness

The edge camber and the out-of-squareness of a plate shall be limited so that it shall be possible to inscribe a rectangle with the dimensions of the ordered plate, within the size of the delivered goods.

Additionally, if agreed at the time of the enquiry and order, edge camber can be limited to 0,2 % of the actual length of the plate, and out-of-squareness to 1 % of the actual width of the plate (*G*).

(Option 2, see clause 9.)

5.2 Flatness

5.2.1 The steel types in accordance with Tables 5, 6 and 8 are defined as follows:

- steel type L: products with a specified minimum yield strength $\leqslant$ 460 N/mm^2, neither quenched nor quenched and tempered;
- steel type H: products with a specified minimum yield strength $>$ 460 N/mm^2 but $<$ 700 N/mm^2 and/or all grades of quenched and quenched and tempered products.

5.2.2 For Table 7, the steel types are defined as follows:

- steel type L: products with a specified minimum tensile strength $\leqslant$ 430 N/mm^2;
- steel type H: products with a specified minimum tensile strength $>$ 430 N/mm^2.

5.2.3 Tolerances on flatness are given in Tables 5 to 8.

The applicable table shall be subject to agreement at the time of enquiry and order.

Table 5 — Normal tolerances for flatness, class N, measurement on 1 000 mm or 2 000 mm length

Dimensions in millimetres

Nominal thickness t	Steel type L [a]		Steel type H [a]	
	Measuring length			
	1 000	2 000	1 000	2 000
$4 \leqslant t < 5$	9	14	12	17
$5 \leqslant t < 8$	8	12	11	15
$8 \leqslant t < 15$	7	10	10	14
$15 \leqslant t < 25$	7	10	10	13
$25 \leqslant t < 40$	6	9	9	12
$40 \leqslant t \leqslant 400$	5	8	8	11

[a] See 5.2.1.

Table 6 — Tolerances for flatness, class R, measurement over a 2 000 mm or a 4 000 mm length

Dimensions in millimetres

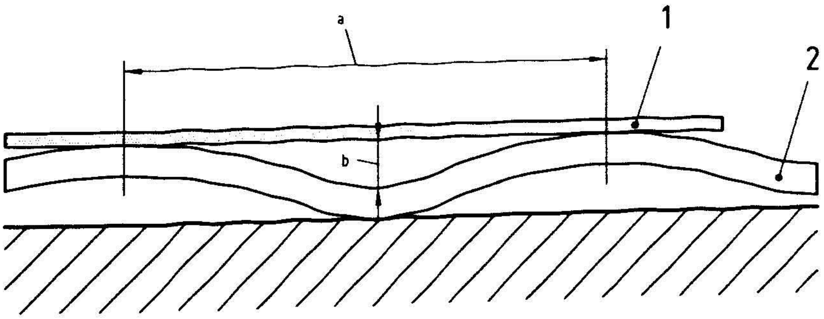
Nominal thickness t	Straightedge				
	2 000		4 000		
	Nominal plate width, w				
	$w < 2\,000$	$w \geqslant 2\,000$	$w < 2\,000$	$2\,000 \leqslant w < 3\,000$	$w \geqslant 3\,000$
$4 \leqslant t < 5$	14	24	26	[a]	[a]
$5 \leqslant t < 8$	13	21	22	28	[a]
$8 \leqslant t < 15$	12	16	12	16	24
$15 \leqslant t < 25$	12	16	12	16	22
$25 \leqslant t < 40$	9	13	9	13	19
$40 \leqslant t < 80$	8	11	8	11	16
$80 \leqslant t < 150$	8	10	8	10	15
$150 \leqslant t < 250$	10	15	10	15	20
$250 \leqslant t \leqslant 400$	20	20	20	20	20

Deviation from flatness shall be determined by measuring the deviation in distance between the plates and straightedge of 2 000 mm long which may be placed in any direction. For steel plates less than 2 000 mm in wave pitch (see Figure 1), the values given in the above table for a 2 000 mm straightedge shall be applied. For steel plates over 4 000 mm in wave pitch, the values given in the above table for a 4 000 mm straightedge shall be applied to any 4 000 mm length.

NOTE 1 Values given above are for type L (see 5.2.1).

NOTE 2 Values for type H = 1,5 × values for type L (see 5.2.1).

[a] Subject to be agreement between purchaser and manufacturer.



Key

1 Straightedge
2 Plate

[a] Wave pitch
[b] Flatness

Figure 1 — Measuring of flatness on wave pitch

Table 7 — Tolerances for flatness, class Q, measurement on 4 000 mm length

Dimensions in millimetres

Nominal thickness t	Nominal plate width, w		
	$w < 2\,000$	$2\,000 \leqslant w < 3\,000$	$w \geqslant 3\,000$
$4 \leqslant t < 5$	26	a	a
$5 \leqslant t < 8$	22	28	a
$8 \leqslant t < 15$	12	16	24
$15 \leqslant t < 25$	12	16	22
$25 \leqslant t < 40$	9	13	19
$40 \leqslant t < 80$	8	11	16
$80 \leqslant t < 150$	8	10	15
$150 \leqslant t < 250$	10	15	20
$250 \leqslant t \leqslant 400$	20	20	20

The longer dimension specified is considered the length and variation in flatness along the length shall not exceed the tabular amount for the specified width in plates up to 4 000 mm in length or over any 4 000 mm of longer plates

When the longer dimension is under 1 000 mm the variation in flatness along the length and across the width shall not exceed 6 mm for type L and 10 mm for type H in each direction. When the longer dimension is from 1 000 mm to 2 000 mm, the flatness variation permitted shall not exceed 75 % of the tabular amount for the specified width but in no case less than 6 mm for type L and 10 mm for type H.

NOTE 1 Values given in the above table are for type L (see 5.2.2)

NOTE 2 Values for type H = 1,5 × values for type L (see 5.2.2)

[a] Subject to agreement between purchaser and manufacturer.

Table 8 — Special tolerances for flatness, class S, measurement on 1 000 mm or 2 000 mm length

Dimensions in millimetres

Nominal thickness t	Steel type L [a, b]				Steel type H [a]	
	Nominal plate width, w					
	≥ 2 750		< 2 750			
	Measuring length					
	1 000	2 000	1 000	2 000	1 000	2 000
$3 \leqslant t < 8$	4	8	5	10	Shall be agreed at the time of enquiry and order	
$8 \leqslant t < 250$	3	6	3	6		
$250 \leqslant t \leqslant 400$	c	c	c	c		

[a] See 5.2.1.

[b] Tighter tolerances shall be the subject of special agreement at the time of enquiry and order.

[c] Subject to agreement between purchaser and manufacturer.

6 Excess mass

6.1 The excess mass is the difference between the actual delivered mass and the theoretical mass expressed as a percentage of the theoretical mass of the delivered goods. Unless otherwise specified in the appropriate quality standard, the theoretical mass shall be determined using a volumetric mass of 7,85 kg/dm^3 for carbon steels.

For alloy steels, the values of the applicable quality standard apply.

6.2 Upper limits for the excess mass corresponding to the thickness tolerance class N, A, B or C (see 4.1) are given in Table 9.

6.3 The excess masses given in Table 9 apply to delivered goods with the same nominal dimensions and of the same quality, the mass of which is between 25 t and 75 t.

The modifications to the upper limits of the excess mass for delivered goods of different masses are given in the note under Table 9.

The excess masses for all tolerance classes given in Table 9 shall be adjusted in relation to the lot mass as detailed below where MA is the specified value for class N.

- excess mass ⩾ 150 t: − 0,2 × MA
- ⩾ 75 t excess mass < 150 t: − 0,1 × MA
- ⩾ 25 t excess mass < 75 t: values in accordance with Table 9
- ⩾ 10 t excess mass < 25 t: + 0,2 × MA
- excess mass < 10 t: + 0,4 × MA

For single plates: more than + 0,4 × MA by special agreement with the customer.

(Option 5, see clause 9.)

EXAMPLE: Lot mass 100 t; nominal dimensions 20 mm × 2 500 mm × 4 500 mm; tolerance class N:

correction value: − 0,10 × 5,0 % = − 0,5 %; excess mass: 3 % − 0,5 % = 2,5 %

These excess mass values have taken into account tolerances on width and length.

6.4 Excess masses which exceed the limits of Table 9 shall not be cause for rejection, unless otherwise agreed at the time of enquiry and order.

(Option 4, see clause 9.)

6.5 Where the purchaser and supplier agree to apply some other excess mass requirements, it shall be applied as agreed between the parties.

(Option 4, see clause 9).

Table 9 — Excess mass, classes N (Table 1), A, B and C (Table 2)

Nominal thickness t mm	Class	Excess mass, % Nominal plate width, w mm $600 \leqslant w < 2\,000$	$2\,000 \leqslant w < 2\,500$	$2\,500 \leqslant w < 3\,000$	$3\,000 \leqslant w < 3\,500$	$w \geqslant 3\,500$
$4{,}00 \leqslant t < 5{,}00$	N	3,5	4,5	5,5	—	—
	A	8,5	9,5	10,5	—	—
	B	11,0	12,0	13,5	—	—
	C	19,0	20,5	21,5	—	—
$5{,}00 \leqslant t < 8{,}00$	N	3,5	4,5	5,5	—	—
	A	7,0	7,5	8,5	9,0	—
	B	9,5	9,5	10,0	11,0	—
	C	19,0	20,5	21,5	—	—
$8{,}00 \leqslant t < 15{,}0$	N	3,0	3,0	3,5	4,0	4,5
	A	6,0	6,0	6,5	7,0	7,5
	B	7,5	8,0	8,5	9,0	9,5
	C	10,5	11,0	11,5	12,0	12,5
$15{,}0 \leqslant t < 25{,}0$	N	3,0	3,0	3,0	3,5	3,5
	A	4,5	4,5	5,0	5,0	5,5
	B	6,0	6,0	6,5	6,5	7,0
	C	7,5	8,0	8,0	8,5	8,5
$25{,}0 \leqslant t < 40{,}0$	N	3,0	3,0	3,0	3,5	3,5
	A	3,5	3,5	4,0	4,0	4,0
	B	5,0	5,0	5,5	5,5	5,5
	C	6,0	6,0	6,5	6,5	6,5
$40{,}0 \leqslant t < 80{,}0$	N	3,0	3,0	3,0	3,5	3,5
	A	3,5	3,5	4,0	4,0	4,0
	B	5,0	5,0	5,5	5,5	5,5
	C	5,0	5,5	5,5	5,5	5,5
$80{,}0 \leqslant t < 150$	N	3,0	3,0	3,0	3,5	3,5
	A	3,5	3,5	4,0	4,0	4,0
	B	4,5	4,5	4,5	4,5	4,5
	C	4,5	4,5	4,5	5,0	5,0
$150 \leqslant t < 250$	N	3,0	3,0	3,0	3,0	3,0
	A	3,5	3,5	3,5	3,5	3,5
	B	4,0	4,0	4,0	4,0	4,0
	C	4,0	4,0	4,0	4,0	4,0
$250 \leqslant t \leqslant 400$	N	3,0	3,0	3,0	3,0	3,0
	A	3,5	3,5	3,5	3,5	3,5
	B	4,0	4,0	4,0	4,0	4,0
	C	4,0	4,0	4,0	4,0	4,0

Measurements

.1 General

leasurements shall be carried out at ambient temperature.

.2 Thickness

or plates with trimmed edges, thickness shall be measured at any point situated more than 15 mm from the ansverse or longitudinal edges of the plate, other than locally ground areas (see 4.1.2).

or plates with untrimmed edges, the measuring points shall be agreed upon at the time of the enquiry and order.

.3 Width

Vidth shall be measured perpendicular to the major axis of the plate.

.4 Length

he length of the plate is the length of the largest rectangle contained within the plate.

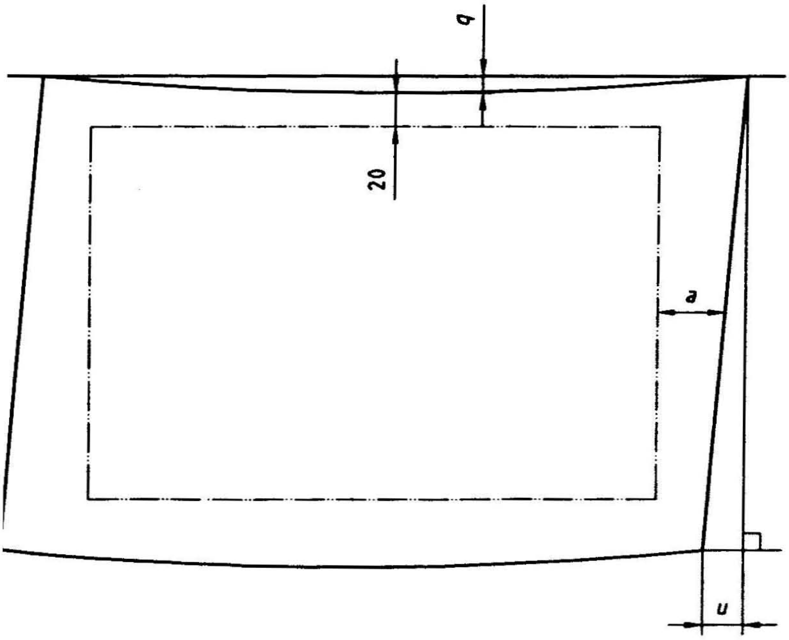
.5 Edge camber

he edge camber value, q, is the maximum deviation between one longitudinal edge and the straight line joining he two ends of this edge. It is measured on the concave edges of the plate (see Figure 2).

.6 Out-of-squareness

he out-of-square value, u, is the orthogonal projection of one transverse edge on one longitudinal edge (see igure 2).

Dimensions in millimetres



a = 200 mm for flatness tolerances in accordance with Tables 5 to 7

a = 100 mm for flatness tolerances in accordance with Table 8

q = Edge camber

u = Out-of-square

Figure 2 — Measuring of edge camber, out-of-square and flatness

7.7 Flatness

To measure flatness the plates shall be placed on a flat surface.

Deviation from flatness shall be determined by measuring the deviation in distance between the plates and a straight-edge of length 1 000 mm, 2 000 mm or 4 000 mm (see Tables 5 to 8) which may be placed in any direction.

Only the part situated between two points of contact between the straight-edge and the plate shall be taken into consideration. Deviations shall be measured at a point at least 25 mm from the longitudinal edges and at a distance of at least 200 mm (for tolerances in accordance with Tables 5 to 7) or 100 mm (for tolerances in accordance with Table 8) from the plate ends (see Figure 2).

8 Designation

The designation of products in accordance with 2.1, shall also include the exact designation of the ordered steel grade.

EXAMPLE 1

Plate in accordance with this International Standard, of nominal thickness 4,5 mm, Table 1 thickness tolerance (N), nominal width 1 500 mm, with mill edge (NK), nominal length 2 800 mm, with Table 8 special flatness tolerances (S) and an edge camber limited to 0,2 % of the actual length and an out-of squareness limited to 1 % of the actual width (G) of steel E460 DD, as specified in ISO 4950-2 is designated as follows:

plate ISO 7452 - 4,5 N × 1 500 NK × 2 800 SG

steel ISO 4950-2 - E460 DD

EXAMPLE 2

Plate in accordance with this International Standard, of nominal thickness 20 mm, Table 2 class A thickness tolerances, nominal width 2 000 mm, with trimmed edges, nominal length 4 500 mm, with Table 5 normal flatness tolerances (N) of steel E355 E, as specified in ISO 4950-2 is designated as follows:

plate ISO 7452 - 20 A × 2 000 × 4 500 N

steel ISO 4950-2 - E355 E

9 Options

See 2.2:

1) whether mill edges are required (see 2.1 and 4.2.2);
2) whether a limited edge camber and out-of-squareness is required (see 2.1 and 5.1);
3) what tolerances on length for plates with a nominal length > 20 000 mm are required (see 4.3; Table 4);
4) whether it is a reason for rejection when the excess masses exceed the limits of Table 9 (see 6.4) or other excess mass requirements;
5) which excess mass over 40 % shall be used for single plates (see Table 9).

Annex A
(normative)

Maximum thickness difference within any plate

Optionally and in addition to the tolerances on thickness given in Table 1 and Table 2, a maximum thickness difference within any plate given in Table A.1 shall be applied.

Table A.1 — Maximum thickness difference within any plate

Dimensions in millimetres

Nominal thickness	Nominal plate width, w		
t	$600 \leqslant w < 2\,000$	$2\,000 \leqslant w < 4\,000$	$w \geqslant 4\,000$
$4 \leqslant t < 5$	0,80	1,00	–
$5 \leqslant t < 8$	0,90	1,00	–
$8 \leqslant t < 15$	0,90	1,10	1,20
$15 \leqslant t < 25$	1,00	1,20	1,40
$25 \leqslant t < 40$	1,10	1,30	1,40
$40 \leqslant t < 80$	1,20	1,40	1,60
$80 \leqslant t < 150$	1,30	1,50	1,70
$150 \leqslant t < 250$	1,40	1,60	1,80
$250 \leqslant t \leqslant 400$	1,60	1,80	2,00

MGIPF—965 Deptt. of BIS/08—27-2-09—300 Books.

Bibliography

[1] ISO 4950-2, *High yield strength flat steel products — Part 2: Products supplied in the normalized or controlled rolled condition*

[2] ISO 4995, *Hot-rolled steel sheet of structural quality*

[3] ISO 4996, *Hot-rolled steel sheet of high yield stress structural quality*

[4] ISO 5951, *Hot-rolled steel sheet of higher yield strength with improved formability*

[5] ISO 5952, *Continuously hot-rolled steel sheet of structural quality with improved atmospheric corrosion resistance*

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